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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,585	07/31/2003	Nobuaki Kabuto	16869N-088200US	5007

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EXAMINER

KOVALICK, VINCENT E

ART UNIT

PAPER NUMBER

2629

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/632,585

Applicant(s)

KABUTO ET AL.

Examiner

Vincent E. Kovalick

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-21 is/are allowed.
- 6) ☒ Claim(s) 1-5 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/31/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Applicant's Amendment dated February 8, 2006 in response to USPTO Office Action dated October 5, 2005.

The addition of new claim 22 and Applicant's Remarks have been noted and entered in the record.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagisawa et al. (USP 6,259,198) taken with Moriyama (USP 5,479,188).

Relative to claim 1, Yanagisawa et al. **teaches** a flat panel display apparatus with an array of electron emitting devices (col. 1, lines 55-67 and col. 2, lines 1-67); Yanagisawa et al. further **teaches** a display apparatus comprising: a front substrate on which a fluorescent material is provided; a rear substrate disposed opposite to said front substrate and having a plurality of electron emission devices laid out thereon to form a matrix, each of said electron emission devices radiating electrons to said fluorescent material (col. 5, lines 57-67; col. 6, lines 1-12; Fig. 1 and Abstract).

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Yanagisawa et al. **does not teach** a driver capable of applying two or more driving voltages sequentially, which are generated on the basis of an input video signal and have levels independent from each other, during a select period to a least one row of specific electron emission devices selected among said electron emission devices.

Moriyama **teaches** a method for driving a Liquid Crystal Display panel, with reduced flicker and with no sticking (col. 2, lines 34-67 and col. 3, lines 1-34); Moriyama further **teaches** a driver capable of applying two or more driving voltages sequentially, which are generated on the basis of an input video signal and have levels independent from each other, during a select period to a least one row of specific electron emission devices selected among said electron emission devices (col. 7, lines 11-26).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Yanagisawa et al. the feature as taught by Moriyama in order to put in place means to generate the driver signals corresponding to the video input signal required to drive the electron emission devices in order to generate the desired image on the flat panel display apparatus.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagisawa et al. taken with Moriyama as applied to claim 1 in item 3 hereinabove, and further in view of Kim (USP 6,154,187).

Regarding claim 2, Yanagisawa et al. taken with Moriyama **does not teach** said display apparatus wherein the said input video signal is a digital video signal.

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Kim **teaches** an apparatus for processing video data in AC type plasma display panel system (col. 3, lines 33-67 and col. 4, lines 1-9): Kim further **teaches teach** said display apparatus wherein the said input video signal is a digital video signal.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Yanagisawa et al. taken with Moriyama the feature as taught by Kim in order to convert the video signal from analog to digital in order to provide a signal in the format compatible for further processing in the display system.

Moriyama further **teaches** two or more driving voltages are generated on the basis of a digital signal obtained as a result of converting the bit count of said digital video signal (col. 7, lines 51-62) . It being understood that the driving voltage level would correspond to the level indicated by the converted value of a bit count.

5. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagisawa et al. taken with Moriyama as applied to claim 1 in item 3 herein above, and further in view of Huang et al. (Pub. No. US 2002/0036602) taken with Takahashi et al. (Pub. No. US 2003/0011551).

Relative to claim 3, Yanagisawa taken with Moriyama **does not teach** said display apparatus further comprising a scanning driver for applying to said scanning electrodes a select voltage for selecting at least one row of specific electron emission devices selected among said electron emission devices during a predetermined select period; and a signal drive for applying to said signal electrodes a driving voltage having a level depending on an input video signal for driving said electron emission devices; wherein, the duration of said select period is determined by the

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output period of said select voltage. said select period is divided into a plurality of sub-periods; and said driving voltage is applied in each of said sub-periods.

Huang et al. **teaches** a method of driving a plasma display panel and apparatus thereof (pg. 2, paras. 0016-0018); Huang et al. further **teaches** said display apparatus further comprising a scanning driver for applying to said scanning electrodes a select voltage for selecting at least one row of specific electron emission devices selected among said electron emission devices during a predetermined select period; and a signal drive for applying to said signal electrodes a driving voltage having a level depending on an input video signal for driving said electron emission devices (pg 1, para 0006 and Fig. 2); wherein, the duration of said select period is determined by the output period of said select voltage (pg. 1, paras. 0007-0009).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Yanagisawa et al. taken with Moriyama the features as taught by Huang et al. in order to put in place the means for selecting the desired row of electron emitting devices to be activated for the period of time corresponding to the output level of the select voltage.

Yanagisawa et al. taken with Moriyama in view of Huang et al. **does not teach** said select period is divided into a plurality of sub-periods; and said driving voltage is applied in each of said sub-periods.

Takahashi et al. **teaches** a Liquid Crystal Display Device (pg. 2, paras. 0015-0023); Takahashi et al. further **teaches** said select period is divided into a plurality of sub-periods; and said driving voltage is applied in each of said sub-periods (pg. 4, para. 0043).

It would have been obvious to a person of ordinary skill in the art at the time of the invention

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to provide to the device as taught by Yanagisawa et al. taken with Moriyama in view of Huang et al. the feature as taught by Takahashi et al. in order to supply driving voltage for each of the sub-periods corresponding to the gradation level required by the video signal.

Regarding claim 4, Takahashi et al. . further **teaches** said display apparatus wherein the level of said driving voltage applied to said signal electrodes is changed for each of said sub-periods (pg. 4, para. 0043).

Relative to claim 5, Huang et al. further **teaches** a plurality of scanning electrodes extended in a screen horizontal direction and a plurality of signal electrodes extended in a screen vertical direction (pg. 1, paras.0006-0007 and Fig. 1); and a screen on which a plurality of display devices are placed at intersecting points of said scanning electrodes and said signal electrodes to form a matrix (pg. 1, paras. 0006-0007 and Fig. 2, item 100); still further Huang et al. **teaches** a driving signal generator capable of generating first and second driving signals, which have values independent from each other and each sever as a signal for driving said display devices, on the basis of an input video signal (pg. 1, paras. 0006-0007 and Fig. 2); wherein the duration of said select period of said row of specific display devices is determined by said select voltage generated by said scanning driver; and in said select period, diving voltages obtained on the basis of said first and second driving signals generated by said driving signal generator are applied consecutively to said signal electrodes (pg. 1, paras. 0007-0008 and Fig. 2).

6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagisawa et al. taken with Moriyama in view of Huang et al. taken with Takahashi et al as applied to claim 5 in item 5 herein above, and further in view of Abe et al. (Pub. No. 2003/0016189).

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Regarding claim 22, Yanagisawa et al. taken with Moriyama in view of Huang et al. taken with Takahashi et al. **does not teach** a display apparatus wherein a select period corresponds to at least two horizontal scanning periods.

Abe et al. **teaches** a display driving method and apparatus utilizing the same ((pgs. 1-3, paras. 0016-0067); Abe et al. further **teaches** a display apparatus wherein a select period corresponds to at least two horizontal scanning periods (pg. 1, para. 0018).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Yanagisawa et al. taken with Moriyama in view of Huang et al. taken with Takahashi et al. the feature as taught by Abe et al. in order to provide a display driving method capable of obtaining a quality image by avoiding a wasteful period

Allowable Subject Matter

7. Claims 6-21 are allowed.

8. The following is an examiner's statement of reasons for allowance:

Relative to claim 6, the major difference between the teachings of the prior art of record (USP 6,259,198, Yanagisawa et al.; USP 6,154,187, Kim and Pub No. US 2002/0036601, Huang et al.) and that of the instant invention is that said prior art of record **does not teach** a display apparatus comprising a switch for outputting said first driving signal generated by said driving signal generator during a first period for the select period determined by an output period of the select voltage generated by said scanning driver and outputting said second driving signal generated by said driving signal generator during a second period for the select period determined by an output period of the select voltage generated by said scanning driver; and a D/A

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converter for converting said first and second driving signals output by said switch into analog signals and for applying the analog signals to said signal electrodes as first and second driving voltages respectively

Regarding claim 19, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not** teach a signal driver employed in a display apparatus comprising: an n-bit gray-scale signal input terminal for inputting an n-bit gray-scale signal wherein $n \geq 8$; a sub-period select signal input terminal for inputting a sub-period specification signal for specifying one of m sub-periods obtained as a result of dividing a select period of said scanning electrodes wherein $m \geq 2$; an output circuit for outputting k voltage levels where $k \leq (\text{the } n\text{th power of } 2/m)$; and a signal converter for selecting one of said voltage (or current) levels on the basis of said n-bit gray-scale signal and said sub-period specification signal.

Relative to claim 20, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a display apparatus comprising spacers placed between said rear substrate and said front substrate to create a space between said rear substrate and said front substrate; wherein, each specific one of said scanning electrodes is connected to two rows each comprising a group of specific electron emission devices; said two rows each comprising a group of specific electron emission devices are connected respectively to two different ones of said signal electrodes; and each of said spacers is located substantially at the center of said two rows each comprising a group of specific electron emission devices on said specific scanning electrode.

Response to Applicant's Remarks

9. Relative to Applicant's remarks regarding claims 1-2 wherein 'Prior art Kim' "does not explicitly teach at least two driving voltages with levels different from each other being applied to selected display devices" New prior art (USP 5,479,188, Moriyama) has been introduced to address this limitation in claims 1-2.

Regarding Applicant's remarks relative to claims 3-5, wherein the 'Huang reference' "does not disclose the feature of a select period being divided into a plurality of sub-periods" New prior art (Pub. No. US 20030011551, Takahashi et al.) has been introduced to address this limitation.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U. S. Patent No.	6,472,803	Yoshizawa et al.
U. S. Patent No.	4,481,511	Hanmura et al.
Pub. No..	US 2002/0130824	Huang et al.
Pub. No.	US 2002/0036460	Takanaka et al.
Pub. No.	US 2002/0018032	Weitbruch et al.

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To Respond

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent E. Kovalick whose telephone number is 571-272-7669. The examiner can normally be reached on Monday-Thursday 7:30- 4:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Vincent E. Kovalick

April 13, 2006



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